UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105-3901

OCT [illegible] 2000

Helen Hankins
Bureau of Land Management
Elko Field Office
3900 East Idaho Street
Elko, NV 89801-4611

Dear Ms. Hankins:

The U.S. Environmental Protection Agency (EPA) has reviewed the **Draft Environmental Impact Statement (DEIS) for the Newmont Mining Corporation's South Operations Area Project Amendment, Eureka and Elko counties, Nevada**. Our review and comments are provided pursuant to the National Environmental Policy Act (NEPA), the Council on Environmental Quality's NEPA Implementation Regulations at 40 CFR 1500-1508, and Section 309 of the Clean Air Act.

The DEIS evaluates alternatives for expanding gold mining operations at Newmont's South Operations Area. The proposed action involves additional mining to approximately 350 feet below the currently approved operating level of the Gold Quarry open pit, continued dewatering of the mine and discharge of up to 30,000 gallons per minute into Maggie Creek, expansion of waste rock disposal facilities and leach facilities, and construction of associated ancillary facilities. Alternative 1 includes backfilling of the Mac open pit. Alternative 2 modifies the gold Quarry South Waste Rock Disposal Facility to result in less surface disturbance. The No Action Alternative is also analyzed. The BLM preferred alternative is Alternative 1, the proposed action with backfilling the Mac pit.

We have rated this DEIS as EO-2 -- Environmental Objections-Insufficient Information (See enclosed "Summary of Rating Definitions and Follow Up Actions"). Our rating is based on our objections to the project as proposed because of its apparent significant impacts to water and air quality. We do not believe the Plan of Operation requires sufficient measures to ensure against acid rock drainage, contaminated pit lake water, or mercury emissions to the air. Additional information is necessary in the Final Environmental Impact Statement (FEIS) regarding site geochemistry; direct and cumulative impacts to air and water quality, waters of the U.S., and wildlife; air and water quality monitoring; waste rock disposal; and reclamation and bonding. Our detailed comments are enclosed.

In addition, we have reviewed BLM's "*Cumulative Impacts Analysis of Dewatering and Water Management Operations for the Betze Project, South Operations Area Project*

Amendment, and Leeville Project" (April, 2000). Our enclosed comments also address this report.

We appreciate the opportunity to review this DEIS. Jeanne Geselbracht, EPA's principal reviewer on this project will contact you to arrange for a session to discuss our comments. Meanwhile, should you have any questions, please contact David Farrel, Chief, Federal Activities Office at (415) 744-1584, or have your staff contact Ms. Geselbracht at (415) 744-1576. As a reminder, when it is officially filed with EPA HQs, office please send two copies of the FEIS to this office (Mailcode CMD-2).

Sincerely,

Deanna M. Wieman, Deputy Director
Cross-Media Division

Enclosures

cc: Dave Gaskin, Nevada Division of Environmental Protection
Nancy Kang, U.S. Army Corps of Engineers - Reno
Stan Wiemeyer, U.S. Fish and Wildlife Service - Reno
Laura Berglund, U.S. Fish and Wildlife Service - Winnemucca

SUMMARY OF EPA RATING DEFINITIONS

This rating system was developed as a means to summarize EPA's level of concern with a proposed action. The ratings are a combination of alphabetical categories for evaluation of the environmental impacts of the proposal and numerical categories for evaluation of the adequacy of the EIS.

ENVIRONMENTAL IMPACT OF THE ACTION

"LO" (Lack of Objections)

The EPA review has not identified any potential environmental impacts requiring substantive changes to the proposal. The review may have disclosed opportunities for application of mitigation measures that could be accomplished with no more than minor changes to the proposal.

"EC" (Environmental Concerns)

The EPA review has identified environmental impacts that should be avoided in order to fully protect the environment. Corrective measures may require changes to the preferred alternative or application of mitigation measures that can reduce the environmental impact. EPA would like to work with the lead agency to reduce these impacts.

"EO" (Environmental Objections)

The EPA review has identified significant environmental impacts that must be avoided in order to provide adequate protection for the environment. Corrective measures may require substantial changes to the preferred alternative or consideration of some other project alternative (including the no action alternative or a new alternative). EPA intends to work with the lead agency to reduce these impacts.

"EU" (Environmentally Unsatisfactory)

The EPA review has identified adverse environmental impacts that are of sufficient magnitude that they are unsatisfactory from the standpoint of public health or welfare or environmental quality. EPA intends to work with the lead agency to reduce these impacts. If the potentially unsatisfactory impacts are not corrected at the final EIS stage, this proposal will be recommended for referral to the CEQ.

ADEQUACY OF THE IMPACT STATEMENT

Category 1" (Adequate)

EPA believes the draft EIS adequately sets forth the environmental impact(s) of the preferred alternative and those of the alternatives reasonably available to the project or action. No further analysis or data collection is necessary, but the reviewer may suggest the addition of clarifying language or information.

"Category 2" (Insufficient Information)

The draft EIS does not contain sufficient information for EPA to fully assess environmental impacts that should be avoided in order to fully protect the environment, or the EPA reviewer has identified new reasonably available alternatives that are within the spectrum of alternatives analysed in the draft EIS, which could reduce the environmental impacts of the action. The identified additional information, data, analyses, or discussion should be included in the final EIS.

"Category 3" (Inadequate)

EPA does not believe that the draft EIS adequately assesses potentially significant environmental impacts of the action, or the EPA reviewer has identified new, reasonably available alternatives that are outside of the spectrum of alternatives analysed in the draft EIS, which should be analysed in order to reduce the potentially significant environmental impacts. EPA believes that the identified additional information, data, analyses, or discussions are of such a magnitude that they should have full public review at a draft stage. EPA does not believe that the draft EIS is adequate for the purposes of the NEPA and/or Section 309 review, and thus should be formally revised and made available for public comment in a supplemental or revised draft EIS. On the basis of the potential significant impacts involved, this proposal could be a candidate for referral to the CEQ.

*From EPA Manual 1640, "Policy and Procedures for the Review of Federal Actions Impacting the Environment."

Hazardous Air Pollutants

Mercury is a persistent bioaccumulative toxic substance that has been receiving increased attention over the past three years. EPA is becoming increasingly concerned about even small releases of mercury to the atmosphere. Pristine lakes in Wisconsin and remote areas of the Florida Everglades are finding mercury levels in fish above Federal standards for fish consumption. Studies have revealed this mercury is from atmospheric deposition from mercury emissions that are thousands of miles away. EPA now considers mercury air emissions over ten pounds as a significant enough concern that, starting this year, such emissions must be reported by a mining company in its annual TRI submitted to EPA.

Recent 1998 TRI information submitted by Nevada gold heap leach mining companies has revealed that these mines can be significant sources of mercury point source air emissions from autoclaves, roasters, stripping units, electrowinning units, retorts, refining furnaces, and carbon regeneration kilns.

According to the Toxic Release Inventory (TRI) for 1998, Newmont's South Operations (the South Operations) emitted 460 pounds of mercury to air. Table 2-3 in the DEIS indicates that 71,440 pounds of mercury-containing waste would be disposed of in a hazardous waste landfill or incinerated. However, the DEIS does not estimate mercury emissions to air, soil, or water resources. The FEIS should estimate releases of mercury and other hazardous air pollutants (HAPs) from the proposed project, and identify all sources of HAPs at the mine, and discuss how all HAPs would be controlled to reduce their emissions as much as possible.

EPA has not yet developed mercury emission standards for mines, so there are no air permit limitations at present. However, it is important for the NEPA document for a heap leach gold mining operation to disclose potentially harmful air emissions whether they are regulated or not. Since EPA and others have only recently become aware of how mercury is transported through the atmosphere and how much mercury is emitted from gold heap leach mines in Nevada, it is understandable that previous gold heap leach facility EISs have not highlighted mercury emissions.

However, given the current levels of concern about mercury emissions to the atmosphere, it is important that the FEIS and future gold heap leach facility EISs present a much more complete description of the existing and future sources of mercury emissions to the atmosphere. The following modifications should be made to the FEIS:

- Chapter 4, "Air Quality" should include a section to specifically quantify existing and future mercury emissions to air.

- The FEIS should list major processing equipment, including any autoclave or roaster, stripping units, electrowinning units, retorts, refining furnaces, and carbon regeneration kilns. Illustrations depicting the processing circuits would be helpful. The FEIS should list in detail and depict all sources of mercury, the unit processes that generate this material, and the equipment included in the system to condense, capture, and/or treat mercury and reduce mercury emissions. A description of this equipment should be included in the FEIS with a discussion on how these measures are effective in removing mercury and making it unavailable for release into the environment. It should also note how any condensed or captured mercury is recycled, sold, or disposed.

- Table 2-3 on page 2-13 indicates that Mill 6 generates 42,000 pounds per year of mercury refining retort residues, 4,000 pounds per year of mercury solids, and 25,640 pounds per year of mercury/palladium catalyst. The FEIS should discuss possible ways to recycle or reclaim this material rather than landfilling or incinerating it.

- BLM may want to verify the information in Table 2-3 that states 42,000 pounds of mercuric/mercurous chloride is from refining retort residues from Mill 6. It is more likely that this residue is from the mercuric/mercurous chloride unit that is part of the air pollution equipment on the roaster.

- Chapter 4, "Air Quality" should discuss in general terms national studies showing that atmospheric deposition of mercury is of environmental concern and describe the likely fate and transport of mercury air emissions from the Newmont South Operations. This discussion need not be in great detail or based on site specific modeling studies, but merely acknowledge what is known nationally about the problems of atmospheric deposition of mercury and how it is affecting this country's water bodies.

- The FEIS should indicate the cumulative amount of mercury that is annually emitted to the air from all mining operations within the cumulative impact area depicted in Figure 5-1 of the DEIS, as well as the cumulative amount of mercury that is annually emitted to the air from gold mines in northern Nevada.

- The FEIS should include a comparison of these cumulative mercury emissions to the total annual (mercury) air emissions in the United States. Table ES-3 in "EPA's 1997 Mercury Study Report, Volume II" lists the national mercury emission rates by industrial category. It shows a total of 155 tons per year of mercury from point sources. Unfortunately, mercury air emissions from Nevada gold mines were not included in this inventory. The FEIS for Newmont is therefore an appropriate document to bring mercury air emissions from gold mines into perspective.

- We recommend that monitoring be conducted to determine mercury emissions from site facilities. The FEIS should describe the monitoring that would be conducted, including locations and reporting requirements.

The FEIS should include the preceeding information so that decision makers are able to know existing and future impacts of mercury emissions from this facility. The absence of air emission permit standards for mercury does not preclude the need to inform decision makers and the public about the quantity and fate of mercury emitted from this facility. Having such information in hand may assist the BLM in determining whether mitigation measures for air mercury emissions should be required of this facility.

For instance, should other mining companies in Nevada be operating with effective pollution control equipment not being used at the South Operations, BLM could ask that such equipment be installed at the South Operations in order to reduce or mitigate potential adverse environmental impacts from mercury emissions. Pollution prevention opportunities should also be explored pursuant to the Pollution Prevention Act of 1990. Pollution prevention opportunities may include processes such as adding chemicals to the barren leach solution that will selectively keep mercury in the heap leach pile while allowing gold to leach out. They may also include recycling of the captured mercury rather than disposal in the Laidlaw/Grassy Mt. Hazardous waste landfill, as identified in Table 2-3 ("Hazardous Waste Streams").

Other Air Quality Impacts

The DEIS (p. 4-6) states that fugitive PM10 (particulates smaller than ten microns) emissions could cause a maximum increase of ambient air concentrations by 17.5 percent to 105 ug/m^3 for a 24-hour period and 27 ug/m^3 for the annual average. The DEIS (p. 4-7) goes on to say that PM10 levels would be temporarily elevated during the enlargement of the Gold Quarry pit, construction of haul roads; enlargement of the Gold Quarry North, Gold Quarry South, and James Creek WRDFs; and construction and enlargement of the Property leach Pad 2, Non-Property Leach Pad, and Refractory Leach Pad. Emissions from enlargement of these facilities, particularly the pit, would not be temporary. It is unclear whether the 105 ug/m^3 (24-hour) and 27 ug/m^3 (annual) emissions projections include emissions from these facilities during construction and enlargement. Furthermore, it is stated on page 3-10 of the DEIS that the highest 24-hour concentration for PM10 was 133 ug/m^3 in 1994. The extra fugitive dust in that case was caused by construction activities. The FEIS should estimate air emissions for all criteria pollutants from *all* mine operations during construction and enlargement of new facilities.

The DEIS (p. 2-24) indicates that the South Area Leach facility would be loaded either by truck or conveyor. We recommend that conveyors be used to reduce emissions of criteria pollutants, particularly PM10. The conveyor should be covered at all water crossings.

Waste Rock Disposal

EPA is extremely concerned about the potential for acid rock drainage at the Newmont South Operations. As excavation deepens the pit, sulfidic material will comprise more of the waste rock, and less waste rock may be available to neutralize this material by encapsulation or

admixing. Newmont's *Refractory Ore Stockpile and Waste Rock Dump Design, Construction and Monitoring Plan* (October 27, 1995) indicates that waste dump designs incorporating encapsulation methods must consider significant quantities of sulfide waste near the end of the mine life (p. B-4). However, the DEIS does not address this serious problem. It indicates only that potentially acid generating (PAG) waste would be encapsulated with non-acid-generating material. The waste rock plan also indicates that neutral or neutralized oxide material will be used to encapsulate the potentially acid generating (PAG) waste. Neither of these documents contains a commitment to ensure that the ratio of acid neutralizing potential (ANP) to acid generating potential (AGP) is adequate to prevent acid generation. In order to be effective as a buffer against the acid generating potential of the PAG waste, the encapsulating material must have a sufficient neutralizing potential. EPA recommends a ANP:AGP of at least 3:1. It does not appear, however, that sufficient neutralizing material will be available to ensure prevention of acid generation, particularly toward the end of mine life. According to Figures 4-16 and 4-17, it appears that the proposed setback excavation would occur on the eastern side of the pit, much of which is either sulfidic siliceous refractory rock or carbonaceous siliceous refractory rock. Both of these rock types are potentially acid generating (DEIS, p. 4-44).

The FEIS should include a summary of the geochemistry studies conducted to determine the acid generating potential of the waste rock piles. This should include static and kinetic test results for representative samples of each rock type, sampling type and frequency, the geochemical model used, volume estimates for each rock type that will be placed in the WRDFs, and volumetric calculations of ANP:AGP. In addition, we question the representativeness of biannual sampling of waste rock. What is the confidence level of biannual sampling of this rock? We recommend more frequent sampling. Furthermore, neutralizing waste rock may need to be stockpiled for purposes of strategic placement. The FEIS should specify, in detail, the requirements and source for the neutralizing material necessary in the waste rock dumps. We respectfully request a copy of the geochemistry report.

The FEIS should also discuss the geochemical requirements for waste rock that would be backfilled into the Mac pit, whether there would a pit lake (and if so, its elevation), and describe the interaction between pit or meteoric waters and the waste rock.

The DEIS (p. 2-11) states that monitoring of waste rock with acid-producing potential is required by NDEP. Newmont's 1995 waste rock plan indicates that waste rock dumps are inspected following heavy spring snow melt or a precipitation event with the potential for runoff. Has this runoff ever been sampled for contaminant concentrations? We recommend that runoff samples be collected after such events in order to determine trends in the waste rock dumps while mining is still taking place in case necessary changes to the waste rock plan become apparent. The FEIS should provide any such monitoring data collected to date for waste rock.

The FEIS should describe procedures that will be required for water quality monitoring and reporting as well as monitoring the functioning of the waste rock dumps in controlling contact

between waste rock and surface or meteoric water (e.g., maintenance of run on/runoff channels, underdrains, and collection areas at base of dumps; ponding on top of dump; etc.).

It is also unclear wether a low permeability cap with "the most economic materials available that inhibit moisture penetration into the dumps, such as clay or alluvium" (p. B-5) would actually provide an adequate barrier to fluid migration. The FEIS should specify the requirements and source for the low permeability caps for the dumps.

We are concerned that the DEIS does not identify or discuss the potential impacts should the waste rock dumps generate acid drainage. For example, the Gold Quarry North Waste Rock Disposal Facility is almost adjacent to Maggie Creek. The FEIS should discuss the potential impacts to surface water and groundwater resources should the waste rock dumps generate acid either in the short- or long-term and identify measures that would be taken to rectify this. The FEIS should indicate whether the bond adequately covers such contingencies during or after closure.

According to the DEIS (p. 4-54), cyanide concentrations in the tailings would be lower than the regulatory limit after a seven-year dewatering closure process. Closure of the tailings would involve collection of the seepage in the seepage collection pond and treatment to meet a weak acid dissociable (WAD) cyanide limit of 0.2 mg/L and a pH of 6-9. The DEIS also states that seepage of 15 gallons per minute would continue to discharge from the tailings after they are dewatered, and that cyanide concentrations in this seepage would be less than the regulatory limit. The FEIS should discuss measures that would be required should cyanide concentrations fail to meet the 0.2 mg/L standard after dewatering (i.e., the residual phase), and should also discuss measures that could be taken to reduce cyanide concentrations in tailings prior to disposal in the tailings impoundment.

The FEIS should project how cyanide and other constituents listed in Table 2-4 would react under pH conditions from 6 to 9, or pH conditions less than 6. The FEIS should also provide acid-base accounting for the tailings, describe the neutralizing capacity of the oxidized tailings, and discuss whether measures should be taken for strategic location of tailings to prevent acid generation. According to Table 2-4, the pH of the tailings is currently 8.55. Is the pH expected to change over time? What are the projected concentrations for each parameter listed in Table 2-4 after seven years and after 30 years? Newmont should be required to monitor the tailings over time before closure is completed to determine trends for pH, sulfate, and other constituents that could provide warning signs for potential long-term problems.

The FEIS should discuss how capture of all seepage from the tailings impoundment would be assured. It is questionable that the residual seepage would meet water quality standards, and it is unclear from the DEIS how contaminated or uncontaminated residual effluent would be disposed. The FEIS should describe how residual effluent would be treated and disposed. How would it be monitored? We recommend that BLM require a long-term care plan for the tailings, with a bond amount sufficient to cover such potential problems.

Heap Leach Facilities

In June, 1997, the Phase II, Non-Property Heap Leach pad at Gold Quarry failed, which resulted in discharges of cyanide to waters of the US. The failure occurred at the clay liner/ HDPE liner interface because the weight of the material on the slope exceeded the friction at the interface. Newmont must ensure an adequate factor of safety for expansions of all leach pads and make sure quality control is maintained by the constructors of the liner (e.g., ensuring an adequate moisture content and compaction in the clay liner). The geotechnical tests showed 60 percent of the density/moisture sample results fell outside of the allowable specifications. Newmont must ensure oversight of its contractors at all of its facilities, including the Gold Quarry facility to prevent geotechnical failures and discharges such as the one which occurred in June, 1997.

The DEIS (2-33) indicates that the refractory leach facility was designed for removal of spent ore. Where would this spent ore be placed for closure? Would strategic location of this ore be required to prevent acid generation? How would the leach pad be closed?

Water Quality

Effluent Monitoring Data: Newmont Mining is permitted to discharge groundwater to Maggie Creek under NPDES Permit No. NV0022268. As a condition of its NPDES permit, Newmont Mining is required to monitor its effluent prior to discharge in Maggie Creek. The DEIS does not contain data from Newmont South Operation's monitoring program. Evaluation of monitoring data is essential to characterize pollutants in the effluent, identify impacts to receiving waters, and determine compliance with applicable water quality criteria. A detailed analysis of existing monitoring data from Newmont's discharge should be included in the EIS, with particular attention to the items listed above.

Bioaccumulative Pollutants: Bioaccumulative pollutants such as mercury and selenium are problematic because they are highly toxic and accumulate in sediments and the tissues of resident biota. The DEIS does not evaluate bioaccumulative pollutant levels in mine discharges, stream sediments, or resident populations. Other studies have indicated that mines may constitute a significant source of bioaccumulative pollutants, depending on local geology and other factors. The FEIS should evaluate existing information on bioaccumulative pollutant levels in mine effluent, receiving waters, and resident populations and calculate mass loadings from the South Operations facility.

An increase in dewatering at the South Operations facility may increase mercury and selenium loading to the Humboldt Sink. The FEIS should evaluate potential impacts to biota in the Humboldt Sink resulting from this loading increase. To evaluate the effects of bioaccumulative pollutants, the mitigation and monitoring program should be expanded to include quarterly water column and sediment monitoring of Maggie Creek and the Humboldt River for bioaccumulative

pollutants. Annual or bi-annual macro-invertebrate bioassessments and fish tissue analyses should be conducted for upstream and downstream reference sites on Maggie Creek and the Humboldt River.

Ambient Water Quality Data: Tables 3-8 and 3-9 of the DEIS contain ambient water quality data from Maggie Creek, Humboldt River, Jack Creek, Simon Creek, Marys Creek, and Susie Creek. Two major deficiencies are noted in Table 3-8: the table does not specify which concentration units are used; and it does not contain data on copper and zinc concentrations. Although Nevada water quality standards are included in Tables 3-11 and 3-12, the DEIS does not evaluate (1) whether water quality parameters in receiving waters meet applicable criteria, or (2) whether the discharge would cause or contribute to violations of water quality standards. If data in Table 3-8 are presented in units of mg/l, the table indicates that pollutant concentrations at several monitoring locations may exceed Nevada water quality standards. Specific pollutants of concern include arsenic, cadmium, chromium, lead, mercury, selenium, and silver. Because they are critical to evaluate the impacts of the proposed project, these issues should be addressed in the FEIS.

The DEIS indicates that Maggie Creek and the Humboldt River exceed drinking water standards for cadmium, chromium, iron, lead, manganese, and silver. However, the document does not indicate whether pollutant concentrations in the water body exceed the applicable water quality criteria for aquatic life, a designated beneficial use of the water bodies in question. Several metals criteria (e.g. cadmium, chromium, copper, lead, nickel, and silver, chromium and lead) must be calculated based on in-stream hardness. Using a long-term average hardness for all of the monitoring sites on Maggie Creek and the Humboldt River, the data in Tables 3-8 and 3-9 should be compared to acute (Criterion Maximum Concentration, CMC) and chronic (Criterion Continuous Concentration, CCC) water quality criteria for aquatic life to determine whether receiving waters meet these water quality criteria. The FEIS should include this information.

Receiving Water Impairment: Table 3-8 indicates that water quality in Maggie Creek and the Humboldt River may be impaired due to metals contamination. Based on this information, the State of Nevada may consider listing Maggie Creek and Humboldt River as impaired under Clean Water Act Section 303(d). Under this provision, the State of Nevada would be required to develop a total maximum daily load (TMDL) for each of the pollutants which exceed applicable water quality criteria.

Receiving water impairment should be considered in the FEIS and the NPDES permitting process. EPA regulations at 40 CFR 122.44(a)(1) state that each NPDES permit shall include "any requirements in addition to or more stringent than promulgated effluent limitations guidelines necessary to achieve water quality standards established under Section 303 of the Clean Water Act." If Maggie Creek and the Humboldt River do not meet surface water quality standards, any discharge containing concentrations of pollutants listed as impaired may contribute to the continuing impairment of the water body.

To conform with EPA regulations at 40 CFR 122.44(a)(1)(ii), discharges from the South Operations facility should meet surface water quality criteria at the point of discharge with no allowance of a mixing zone. The FEIS should also consider whether a mass-loading offset should be required for metals of concern. Such an offset would involve reducing the discharge of metals from a source other than the effluent discharge to effectively reduce the overall mass-loading from the mine to zero.

Nevada Water Quality Criteria: Table 3-12, which contains Nevada water quality criteria, should be revised as follows: (1) water quality criteria for aquatic life should be expressed as µg/l, and (2) the in-stream hardness used to calculate the criteria for hardness-dependent metals should be stated. The hardness-based criteria for cadmium, copper, chromium, lead, nickel, and zinc must be based on the best available estimate of in-stream hardness. As shown in Table 3-8, hardness data are available for each of the monitoring sites in Maggie Creek and the Humboldt River.

Groundwater Quality Data: Table 3-19 contains groundwater quality data from a number of monitoring wells in the South Operations study area. This groundwater will be discharged as part of future dewatering activities at the Newmont facility. Although water quality in the wells varies, it is uncertain how each well will affect the overall concentration of metals in the effluent. The DEIS states that the wells have shown exceedences of drinking water standards for arsenic, iron, and manganese. Because groundwater will be discharged to surface waters, it will also have to meet applicable water quality criteria for aquatic life. Table 3-19 does not specify concentration units for the respective values. The FEIS also should indicate which of the wells would be used for dewatering.

Pit Water Quality: The DEIS (p.4-51) states that the Gold Quarry pit lake would exceed drinking water or aquatic life water quality standards for antimony, manganese, mercury, and selenium. However, there is no discussion of either the potential ecological risks posed or commitments to mitigation measures should they be deemed necessary. Furthermore, the DEIS states that measurements of methylated mercury and inorganic mercury in three Nevada pit lakes (Anaconda, Aurora, and Boss pits) show that methyl-mercury is typically below detection levels. Although methyl-mercury did not show up in the water column, however, it was found at elevated levels in macroinvertebrates in the Yerington pit. It is our understanding that Nevada BLM conducts screening ecological risk assessments when pit lakes are predicted to exceed water quality standards. The FEIS should include the ecological risk assessment or an explanation why one was deemed unnecessary here. The FEIS should also discuss mitigation measures that could be implemented if necessary, as well as the necessary bond amount to cover this contingency.

Process Solutions: The DEIS indicates that Newmont maintains the process solutions in ponds below contaminant levels lethal to wildlife. We do not believe this is an adequate standard, as it does not account for sublethal effects. We recommend that all process ponds be netted or covered with plastic balls.

Waters of the United States

According to the DEIS (p. 4-64), the proposed construction of facilities would involve the discharge of fill materials into approximately one acre of waters of the United States in Section 18. However, there is no discussion of the functions and values of these waters that would be destroyed. Therefore, it is unclear how the proposed new and expanded leach pads would affect these waters or how they might be avoided. The FEIS should include a detailed analysis of the specific impacts to these waters under each alternative.

The proposed project will require an authorizing permit from U.S. Army Corps of Engineers (Corps) pursuant to Section 404 of the Clean Water Act (CWA). The new Nationwide Permit 44 for Mining Activities, which was published by the Corps in the March 9, 2000, Federal Register (65 FR 12818) and became effective on June 5, 2000, limits impacts to waters of the U.S. to 0.5 acre. Because the proposed work would impact 0.98 acres, the project will require an individual permit from the Corps.

All permits requiring permits under Section 404 of the CWA must comply with the Federal Guidelines for Specification of Disposal Sites for Dredged or Fill Materials (40 CFR 230), promulgated pursuant to Section 404(b)(1) of the Clean Water Act ("404(b)(1) Guidelines"). The DEIS does not demonstrate compliance with EPA's 404(b)(1) Guidelines. The following comments provide the rationale for our conclusion.

Project Purpose - The proposed project's purpose is to mine gold. For the purposes of determining compliance with 40 CFR 230.10(a), EPA Region 9 considers that the term "overall project purpose" means the basic project purpose plus consideration of costs and technical and logistical feasibility. Pursuant to 40 CFR 230, any permitted discharge into waters of the U.S. must be the least environmentally damaging practicable alternative available to achieve the project purpose.

Geographic Scope of the Alternatives Analysis - The geographic scope proposed by the applicant is too narrow for the purposes of the alternatives analysis. In defining the project purpose as mining gold, the analysis should include all areas that would be reasonable to consider in this particular industry. The Proposed Action involves construction of the expanded and new leach pads in Section 18. However, neither of the two action alternatives considered in the DEIS includes alternative sites for the leach pads in order to avoid filling waters of the U.S. there. It is unclear, therefore, whether other on-site and off-site alternatives may be available that are less environmentally damaging than the Proposed Action. The FEIS should consider whether the expanded and/or new leach pads proposed in section 18 could be located elsewhere on-site or off-site.

Avoidance, Minimization, and Mitigation - EPA's 404(b)(1) Guidelines are written hierarchically to ensure that efforts are first made to achieve the objective of the CWA to eliminate discharges of pollutants into the nation's waters. Discharges that can be avoided through implementation of

a practicable alternative must be avoided. Discharges that cannot be avoided must be minimized to the extent practicable. Compensatory mitigation should only be used to offset unavoidable impacts that remain.

Determination of Practicability - There is insufficient information in the alternatives analysis to determine practicability of alternatives that could avoid filling waters of the U.S. The 404(b)(1) Guidelines define practicable as available and capable of being done taking into account cost, existing technology, and logistics [40 CFR 230.10(a)(2)]. For example, in determining practicability, a project alternative that achieves a smaller return on investment than the applicant's preferred alternative may be considered practicable for the purposes of 404 permitting, even though that alternative may not be financially acceptable to a particular applicant. In addition, it is important to note that "sunk costs" associated with one site cannot be assigned to an alternative. In evaluating alternatives under the Guidelines, these "sunk costs" cannot be added to the costs of developing a less damaging design or site.

Mitigation- If unavoidable fill in waters of the U.S. can be demonstrated, the FEIS should discuss how potential impacts would be minimized and mitigated. This discussion should include: (a) type of mitigation (e.g., conservation easements, habitat creation, etc.); (b) relation of mitigation areas to project site; (c) acreage and habitat type of waters of the U.S. that would be created or restored; (d) water sources to maintain the mitigation area; (e) revegetation plans including the numbers and age of each species to be planted; (f) maintenance and monitoring plans, including performance standards to determine mitigation success; (g) the size and location of mitigation zones; (h) the parties that would be ultimately responsible for the plan's success; and (i) contingency plans that would be enacted if the original plan fails. Mitigation should be implemented in advance of the impacts to avoid habitat losses due to the lag time between the occurrence of the impact and successful mitigation.

In conclusion, a much more detailed analysis is required in order to determine compliance under EPA's 404(b)(1) Guidelines. This includes, but is not limited to, an increase in the geographic scope of the alternatives; a more thorough assessment of the direct and indirect impacts to the environment for each of the alternatives; comparisons of the costs and profits associated with ongoing gold operations; comparisons of costs and profits associated with the alternatives proposed in the DEIS; and mitigation measures that would be used to offset unavoidable impacts. This information should be included in the FEIS.

Cumulative Impacts

EPA has reviewed the BLM's "*Cumulative Impacts Analysis of Dewatering and Water Management Operations for the Betze Project, South Operations Area Project Amendment, and Leeville Project*" (April, 2000). We commend BLM for its decision to prepare this analysis, as these mines have and will continue to have an enormous impact on the hydrology, hydrogeology, and water quality, as well as vegetation and wildlife, of some areas of the Humboldt River basin. EPA is very concerned that safe yield will be exceeded by dewatering activities in the impact area.

About 30 percent of the groundwater pumped will be removed from the hydrologic system, and it is stated that the regional water balance will be out of equilibrium. It is unclear that the resulting ecological disruption will be appropriately mitigated. Furthermore, the analysis lacks some important information, discussed below, which should be addressed in a follow-up or supplemental analysis. These issues should also be addressed comprehensively within each of the individual EISs for the cumulative impact area.

The cumulative impact of mine dewatering activities to surface water quality in the Humboldt River and Humboldt Sink was limited to arsenic, copper, zinc, fluoride, boron, and total dissolved solids (TDS). In terms of cumulative impacts, the three metals of most concern, cadmium, mercury and selenium, were not included in the analysis. Figure 3-29 in the analysis estimates the potential increase in pollutant loading at the Rye Patch Gage. The text states that this estimate is based on very limited pre-mine data. Due to the lack of data points and information on bioaccumulative metals, this analysis is not sufficient to determine the potential impacts of the dewatering operations on aquatic organisms and terrestrial wildlife.

The cumulative impact analysis lacks adequate water quality, sediment, macro-invertebrate and fish tissue data. Concentrations of selenium that are acutely toxic to nesting waterfowl can accumulate quickly in closed systems such as the Humboldt Sink. The additional mine dewatering discharges to the agricultural run-off flowing to the Humboldt Sink increase the risk that metals such as cadmium and selenium could reach levels acutely toxic to wildlife. Biological samples from fish and wildlife using the Humboldt sink area should also be analyzed on a regular basis to determine if the uptake of bioaccumulative metals is increasing. At the very minimum, the operation of these dewatering facilities should incorporate a long-term monitoring plan to assess the cumulative impact of increasing cadmium, mercury and selenium loadings in the Humboldt Sink. Any monitoring plan to determine long term cumulative impacts should incorporate water and sediment chemistry, fish tissue analysis and macroinvertebrate bioassessments for monitoring points both above and below the mine operations and the Humboldt Sink.

The cumulative impacts to groundwater quality from dewatering and discharge to groundwater do not appear to be addressed. Infiltration ponds, groundwater injection and the use of pumped water for irrigation are proposed or already being used to dispose of pumped water, and the possibility of groundwater degradation from these activities needs to be explored. There should be some comparison of the quality of the receiving formation to the injected or infiltrated water.

In addition, karst related sinkholes are already documented and more are predicted. The impacts of these as new subsurface ingress factors are not explored. The FEIS should discuss how this will affect new conveyances between surface contamination and groundwater.

Figure 7-3 in the analysis illustrates the drawdown area as overlapping a substantial area of the Lahontan cutthroat trout (LCT) habitat, especially on Little Jack and Coyote Creeks. Thus the shape of the drawdown area could be modified (thereby protecting an endangered species habitat) by injecting water into the proper aquifer and maintaining this injection until the surrounding area

rebounds after dewatering has stopped. This injection would have reasonable costs while preventing unnecessary and undue degradation. For example, instead of injecting water and creating a mound in the aquifer downgradient of the pit and creating a cone of depression that is dewatering perennial creeks as shown in figure 3-13, the mining company should inject this water upgradient of the cone of depression and protect upstream springs and perennial stretches.

The three mining companies must be ready to mitigate for seeps that are affected beyond the boundaries of the 10 foot drawdown area. Notwithstanding the difficulty of modeling areas that may be dewatered less than 10 feet, there must be a plan to create hydrologic barriers such as injection wells that will stop dewatering from progressing toward sensitive habitat as the potential is realized by monitoring. This plan must cover all areas affected, regardless of the model.

In section 1-3, both Gold Quarry and Lone Tree provide for a seep and spring enhancement and augmentation program if there are impacts. Barrick should commit to the same program as part of its expansion. Barrick has committed (page 1-11) to accelerated revegetation of areas adversely affected by groundwater pumping. How will these plants survive if they are not matched with a water augmentation program?

Reclamation and Bonding

The DEIS (p. 4-54) states that if rinsing the leach heap does not meet State of Nevada standards, additional neutralization techniques would be used. The FEIS should describe these techniques and indicate whether the bond covers such contingencies. Other Nevada mines have been unable to reduce contaminant levels to these standards and are proposing to discharge to the ground. The FEIS should discuss the conditions under which BLM and NDEP would allow such a discharge. If this is a possibility at the Newmont South Operations, we strongly urge BLM to require the closure bond to cover this contingency.

We were unable to find any information in the DEIS on the bond amounts for the current and proposed operations at Newmont South Operations. The re-opening of the Plan of Operations (POO) should include a reassessment of the adequacy of the financial assurances. The FEIS should identify the bond amounts for each closure and reclamation activity at all of the Newmont South Operations facilities by the end of the project. EPA is aware of several mines that are closing in Nevada which will need long-term operations and maintenance for treatment and/or disposal of water from heap leach pads, tailings, or other mine facilities. The FEIS should also discuss whether long-term operations and maintenance may be necessary *after* closure of the South Operations facilities, and indicate the bond amounts for these as well. We do not believe it is reasonable to delay setting bond amounts for long-term operations until close to closure. EPA strongly recommends that BLM require establishment of funds to cover all potential long-term operations and maintenance activities at the time the POO is issued, while the company still has a strong interest in the property.

Furthermore, the financial assurance necessary to fund post-closure activities must be kept current as conditions change at the mine. BLM and NDEP should ensure that the form of the financial assurance does not depend on the continued financial health of the mining company or its parent corporation. The FEIS should describe the types of bonds held for this site. We strongly recommend that corporate guarantees no longer be accepted at any mine sites. We recommend that a financial trust be created to support long-term operations and maintenance.

In addition to determining the actual cost of reclamation, the bond calculation should consider the extra expense of taking over reclamation at a critical time during operations. Typically, bonds are calculated assuming an orderly closure at the end of mine life. It can be much more expensive to take over reclamation and other environmental protection activities in the middle of active operations, such as when the water balance is high and surplus water must be treated, or when environmental or reclamation measures have not been successful in controlling pollution and must be redone.

Pollution Prevention

Pursuant to the Pollution Prevention Act of 1990, pollution should be prevented or reduced at the source whenever feasible; pollution that cannot be prevented should be recycled in an environmentally safe manner, whenever feasible; pollution that cannot be prevented or recycled should be treated in an environmentally safe manner whenever feasible; and disposal or other release into the environment should be employed only as a last resort and should be conducted in an environmentally safe manner. There are significant opportunities for industry to reduce or prevent pollution at the source through cost-effective changes in production, operation, and raw materials use. Such changes offer mining companies substantial savings in reduced raw material, pollution control, and liability costs as well as help protect the environment and reduce risks to worker health and safety. Examples of pollution prevention techniques may include processes to bind metals such as mercury in leach heaps or extract them from the pregnant solution in order to prevent or reduce emissions both from processing facilities during operations and from leach heaps during and after closure. New pollution prevention techniques are being developed that have promising applications to the mining industry. We recommend that BLM and Newmont actively pursue better pollution prevention techniques to prevent or reduce pollution at the South Operations site.